Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
01 JAN 2012	**N/A**	**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
A novel technique for split-thickness skin donor site pain control: subcutaneous catheters for continuous local anesthetic infusion	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
Lundy J. B., Cancio L. C.,	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
United States Army Institute of Surgical Research, JBSA Fort Sam Houston, TX	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**UU**	**2**	

A Novel Technique for Split-Thickness Skin Donor Site Pain Control: Subcutaneous Catheters for Continuous Local Anesthetic Infusion

To the Editor:

Pain after split-thickness skin grafting can be severe. The current management of donor site pain is limited to oral and parenteral narcotics and nonnarcotic adjuncts, topical analgesics, and regional and axial anesthesia.[1] The ON-Q Postop Pain Relief System (I-Flow Corporation, Lake Forest, CA) consists of an ON-Q pump and Soaker catheter designed to deliver a continuous infusion of local anesthetic to a surgical site. The device is Food and Drug Administration approved for postoperative/postinjury pain control and has been described after laparotomy, thoracotomy, inguinal hernia repair, and rib fractures.[2–4] We describe our experience at the U.S. Army Institute of Surgical Research (USAISR) with the use of subcutaneous catheter placement for continuous infusion of local anesthetic placed deep to lower extremity split-thickness skin graft donor sites. Standard excisional preparation of a skin or soft tissue wound is carried out. A split-thickness donor site is chosen, typically from the upper lateral thigh, and skin is harvested at a depth of 0.010 inches. Autografting is completed and the grafted wounds are dressed. The local anesthetic infusion catheters are then inserted in the subcutaneous space deep to the skin donor site via palpation as the included introducer and needle are advanced. Of note, when using the sharp (as opposed to the blunt tip) introducer, 2 to 3 cm of the distal end of the Soaker catheter must be trimmed to allow it to pass through the introducer and remain with its perforated portion entirely within the subcutaneous space deep to the donor site. The insertion site is placed 2 to 5 cm cephalad to the most proximal portion of the donor site. Two (optionally, only one) 10-cm catheters are passed in parallel, one medially and one laterally, to cover the entire field of a 200-cm^2 donor site (Figure 1). The catheters are primed with 2 ml of ¼% bupivacaine and attached to the ON-Q Pain Pump device, which infuses at a rate of 4 ml/hr. The use of either 0.2% ropivacaine or ¼% bupivacaine for continuous infusion has been described; but due to the bacteriostatic properties of the latter, this is the local anesthetic we prefer.[5] The donor site is dressed with Xeroform gauze. The ON-Q Soaker catheters are secured to the skin with either Steri-Strips (3M Healthcare, St. Paul, MN) or Dermabond (Ethicon, San Lorenzo, Puerto Rico). The tubing that connects the catheter to the Pain Pump is further secured to the skin of the thigh using a clear, occlusive dressing. Early ambulation is encouraged and begins the morning after surgery. A satchel is used to organize and secure redundant tubing and the ON-Q Pump while the patient is upright. The donor site dressing is inspected 24 hours postoperatively and left open to air. Continuous infusion of topical local anesthetic is carried out for 5 consecutive days at which point the catheters are discontinued.

We have used this technique in 11 patients with thermal and soft tissue injuries that have required autografting. The patients were predominantly male (n = 8), had a mean age of 40 years (range, 25–67 years), and had a mean donor site size of 454 cm^2 (range, 100–1200 cm^2) to cover a mean area of 727 cm^2 (range, 100–2000 cm^2). Three of the patients required prior split-thickness skin harvesting for wound coverage without the use of the technique of subcutaneous catheter placement. Of note, all patients reported that their greatest postoperative pain was from the excisionally prepared wound and denied any significant pain from the donor site. The three patients who had undergone prior skin grafting without the use of the ON-Q Pain Pump reported markedly improved pain control at the donor site with the

The opinions or assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting the views of the Department of the Army or Department of Defense.

Address correspondence to Jonathan Lundy, MD, 3400 Rawley Chambers Avenue Fort Sam Houston, Texas 78234. Email: jonathan.lundy1@amedd.army.mil.

1559-047X/2012

DOI: 10.1097/BCR.0b013e3182356095

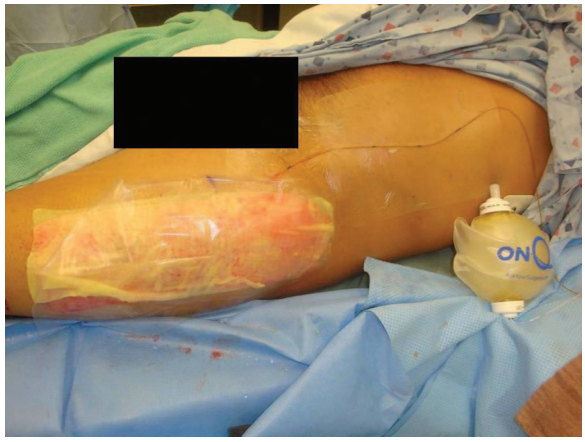

Figure 1. Dressed 200 cm^2 left lateral thigh split-thickness donor site with single subcutaneous catheter and ON-Q pump. Catheter and tubing are secured to patient via Dermabond and adhesive drape.

subsequent skin harvesting. Two patients have experienced minor complications (one catheter insertion site infection and one early catheter discontinuation due to poor skin fixation). This report is limited by its anecdotal, retrospective nature; however, we feel that this is a useful technique to report to the burn community for small split-thickness skin donor site pain control.

REFERENCES

1. Alvi R, Jones S, Burrows D, et al. The safety of topical anaesthetic and analgesic agents in a gel when used to provide pain relief at split skin donor sites. Burns 1998;24:54–7.
2. Truitt MS, Mooty RC, Amos J, Lorenzo M, Mangram A, Dunn E. Out with the old, in with the new: a novel approach to treating pain associated with rib fractures. World J Surg 2010;34:2359–62.
3. Wheatley GH III, Rosenbaum DH, Paul MC, et al. Improved pain management outcomes with continuous infusion of a local anesthetic after thoracotomy. J Thorac Cardiovasc Surg 2005;130:464–8.
4. Sanchez B, Waxman K, Tatevossian R, Gamberdella M, Read B. Local anesthetic infusion pumps improve postoperative pain after inguinal hernia repair: a randomized trial. Am Surg 2004;70:1002–6.
5. Johnson SM, Saint John BE, Dine AP. Local anesthetics as antimicrobial agents: a review. Surg Infect (Larchmt) 2008; 9:205–13.

Jonathan B. Lundy, MD
Leopoldo C. Cancio, MD
U.S. Army Institute of Surgical Research
Fort Sam Houston, Texas